

# DOUBLER

FOR  
THE  
AT-88

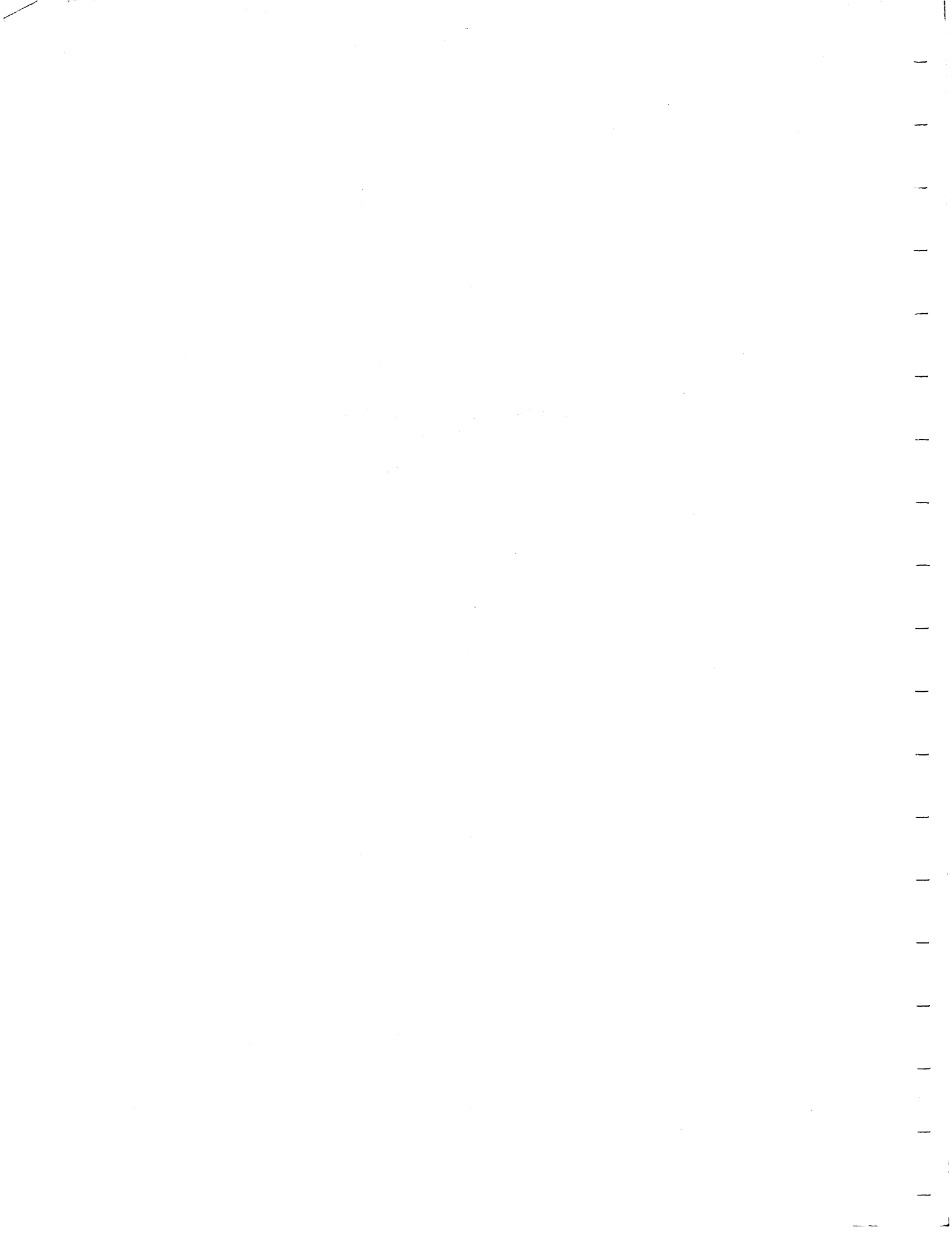
**PERCOM DATA**  
CORPORATION



PERCOM DATA CORPORATION'S  
DOUBLER  
FOR THE  
AT-88 ATARI DRIVE

PERCOM DATA CORPORATION  
11220 Pagemill Road  
Dallas, Texas 75243

Manual Number  
050-2030-002



## RADIO FREQUENCY INTERFERENCE PROTECTION

This equipment generates and uses radio frequency energy. If not installed and used properly, that is, in strict accordance with Percom Data installation and operation instructions, it may cause interference to radio and television reception. There is no guarantee, however, that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, we encourage you to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet in order for the computer and the receiver to be on different branch outlets.

If necessary, consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the United States Government Printing Office, Washington, DC 20402, Stock Number 004-000-0035-4.

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Atari is a trademark of Radio Shack, a Division of Tandy Corporation.

## STATEMENT OF LIMITED WARRANTY

For a period of 90 days from the date of delivery, PERCOM DATA CORPORATION warrants to the original purchaser that the computing equipment described herein shall be free from defects in material and workmanship under normal use and service. During this period, if a defect should occur, the equipment must be returned to the PERCOM DATA CORPORATION Service Facility. The purchaser must prepay all shipping and insurance charges and must supply proof of purchase from PERCOM DATA CORPORATION or an authorized PERCOM DATA dealer or distributor. Purchaser's sole and exclusive remedy in the event of defect is expressly limited to the correction of the defect by adjustment, repair or replacement at Percom Data's election and sole expense, except there shall be no obligation to replace or repair items which by their nature are expendable. This warranty is voided if the unit has been opened, or if the unit has been subjected to improper or abnormal use, or if the unit is altered or modified. No representation or other affirmation of fact, including, but not limited to, statements regarding capacity, suitability for use, or performance of the equipment, shall be deemed to be a warranty or representation by PERCOM DATA CORPORATION, for any purpose, nor give rise to any liability or obligation of PERCOM DATA CORPORATION whatsoever. EXCEPT AS SPECIFICALLY PROVIDED IN THIS AGREEMENT, THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND IN NO EVENT SHALL PERCOM DATA CORPORATION, BE LIABLE FOR LOSS OF PROFITS OR BENEFITS, INDIRECT, SPECIAL, CONSEQUENTIAL OR OTHER SIMILAR DAMAGES ARISING OUT OF ANY BREACH OF THIS WARRANTY OR OTHERWISE.

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Good data processing procedure dictates that the user test the program, run and test sample sets of data, and run the system in parallel with the system previously in use for a period of time adequate to insure that results of operation of the computer or software/firmware are satisfactory.

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## **CHAPTER ONE**

- 1-1 What Did I Buy?
- 1-1 How Does It Work?
- 1-1 What Do I Need to Do?
- 1-1 What Do I Need?

## **CHAPTER TWO**

- 2-1 Caution - Before You Begin
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- 2-2 Remove the Controller Integrated Circuit
- 2-3 Look at the Doubler
- 2-3 Insert the Controller Integrated Circuit on the Doubler
- 2-4 Put the Doubler on the Controller Printed Circuit Board
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## **CHAPTER THREE**

- 3-1 What Happens in this Chapter?
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# CHAPTER ONE

1-1 What Did I Buy?

1-1 How Does It Work?

1-1 What Do I Need to Do?

1-1 What Do I Need?



**Chapter One is an introduction.**

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in financial reporting.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It highlights the importance of using reliable sources and ensuring the accuracy of the information gathered.

3. The third part of the document provides a detailed overview of the results of the study. It includes a summary of the key findings and a discussion of their implications for the field of research.

4. The final part of the document concludes with a series of recommendations for future research and practice. It suggests areas for further exploration and offers practical advice based on the study's findings.

## **What Did I Buy?**

You bought a Percom Data Doubler and a Double-Density OS/A+ 4.1 Operating System for the Percom Data AT-88 Floppy Disk Controller Drive. The Doubler allows you to use the Percom Data Controller and Add-On Drives in double density.

## **How Does It Work?**

If you have a Controller Drive (Drive 1) with a Doubler installed in it, the drive automatically is a single-density drive if you insert a single density operating system diskette, or the drive automatically is a double-density drive if you insert a double-density operating system diskette.

If you have any Add-on Drives (Drive 2, 3, or 4), the Drive(s) must be configured to be double density using the OS/A+ CONFIG Command.

## **What Do I Need to Do?**

You should already have purchased a Percom Data AT-88 Floppy Disk Controller Drive and have it running as part of your system.

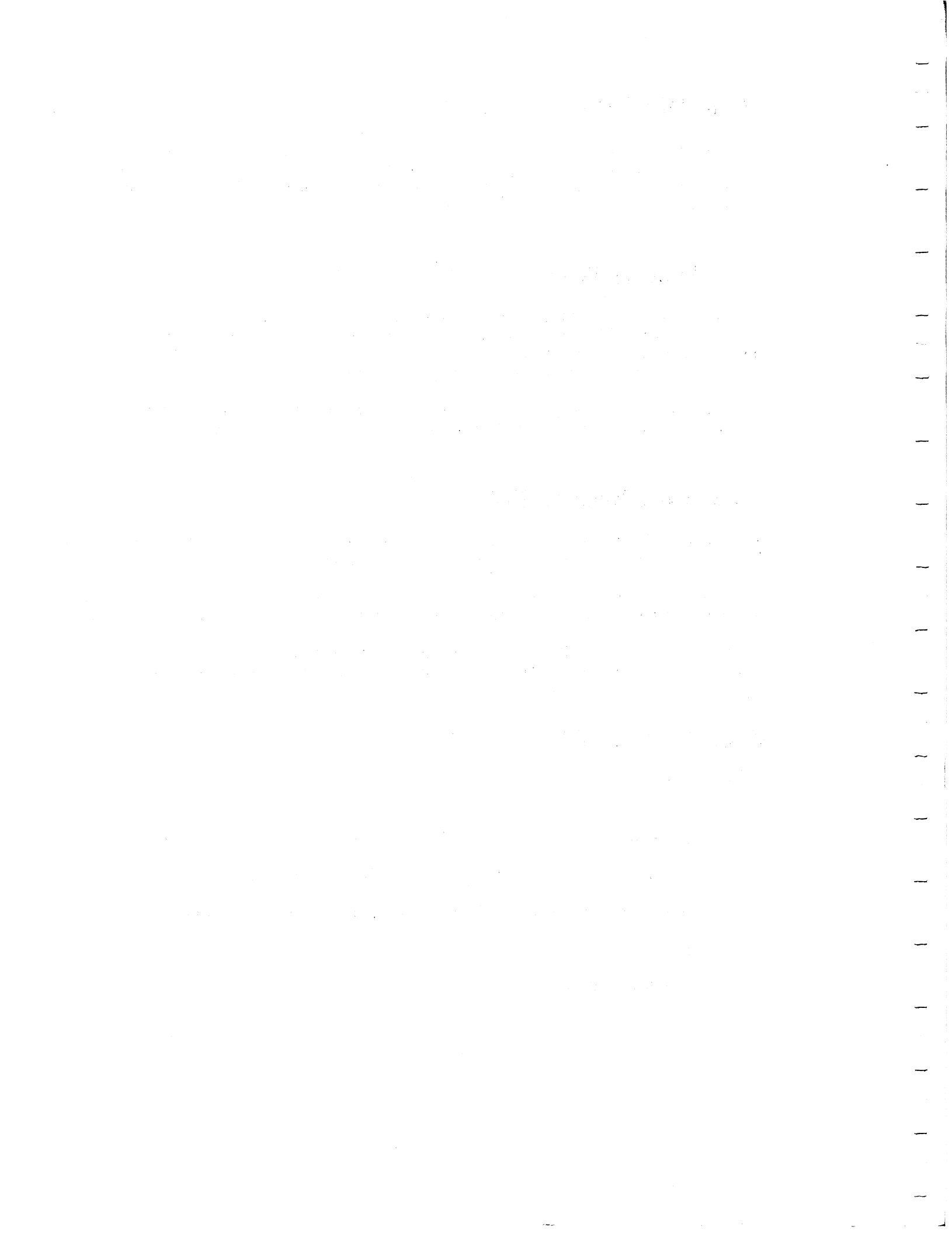
After the Percom Data Controller Drive is running correctly as part of your system, read Chapter 2 and install the Doubler and replace the AT-88 ROM.

If you only have one Percom Data Floppy Disk Drive, perform Chapter 3. If you have two or more Percom Data Floppy Disk Drives, perform Chapter 4.

## **What Do I Need?**

Make sure you have the following:

- An Atari Computer with 48 kilobytes of random access memory.
- A Percom Data AT-88 Floppy Disk Controller Drive
- The Double-Density OS/A+ 4.1 Operating System Diskette.
- An OS/A+ Manual.
- A blank Diskette.



## CHAPTER TWO

- 2-1 Caution - Before You Begin
- 2-1 Get Out Your Tools
- 2-1 Remove the Controller Drive Enclosure Cover
- 2-2 Remove the Controller Integrated Circuit
- 2-3 Look at the Doubler
- 2-3 Insert the Controller Integrated Circuit  
on the Doubler
- 2-4 Put the Doubler on the Controller Printed  
Circuit Board
- 2-4 Look at the AT-88 ROM
- 2-5 Replace the AT-88 ROM on the Controller  
Printed Circuit Board





**Chapter Two describes the installation  
of the Doubler.**

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is essential for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent data collection procedures and the use of advanced analytical techniques to derive meaningful insights from the data.

3. The third part of the document focuses on the implementation of data-driven decision-making processes. It provides a detailed overview of the steps involved in identifying key performance indicators, setting targets, and monitoring progress to ensure that the organization is on track to achieve its strategic objectives.

## Caution – Before You Begin

Integrated chips are very sensitive to charge buildup on their leads (the silver colored part resembling a leg); this condition can destroy an integrated circuit. To avoid charge buildup, please take the following precautions:

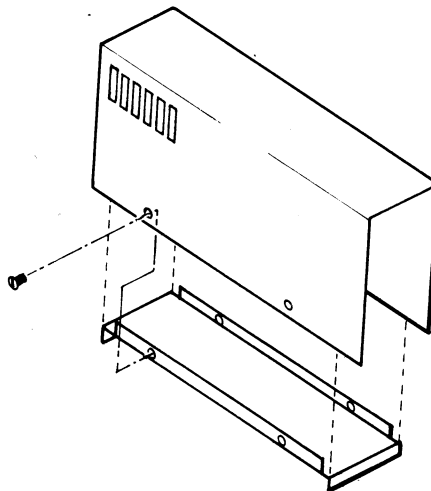
- Wear clothes that do not create a static electrical charge. Silk and synthetic clothes easily create a static charge. Natural fiber clothing, for example, cotton jeans, are more resistant to charge buildup.
- Perform the Doubler installation in an area that is not carpeted. A tile kitchen floor is a good place.
- Get all of your tools and equipment together at the work site before starting the installation, and do not leave the area until you are finished with Chapter 2 and have finished installing the Doubler. By not leaving the area, you can avoid building up static charge that is normally caused by walking across a carpeted area.

## Get Out Your Tools

You need a Phillips-head screw driver to remove the floppy disk drive enclosure cover, and a flat headed screw driver or a fingernail file to remove an integrated circuit from a printed circuit board.

## Remove the Controller Drive Enclosure Cover

To open a Controller Floppy Disk Drive, remove the four Phillips head screws and lift the cover off of the base. Note - Do not remove the enclosure cover of an Add-On Drive (Drive 2, 3 and 4). Only remove the enclosure cover of the Controller Drive (Drive 1).



## Remove the Controller Integrated Circuit

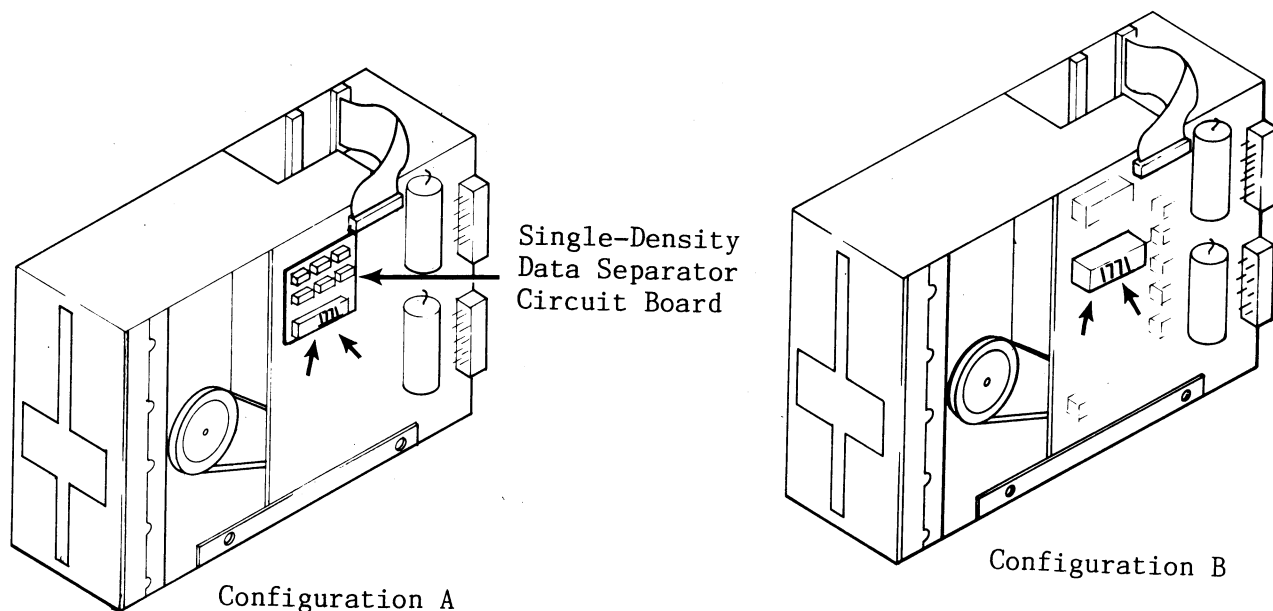
After removing the enclosure cover of the floppy disk drive, note that you have one of two possible drive configurations. Configuration A has a separate single-density data separator circuit board (small square circuit board about 2 inches by 2 inches). Drive B does not have a single-density data separator circuit board.

Find the Controller Integrated Circuit on Configuration A or B; it is labeled 1771, but may have a different prefix or suffix.

Gently remove the Controller Integrated Circuit (labeled 1771) from Configuration A or Configuration B with a flat-head screw driver or a nail file. Pry up one end of the chip a little bit using the screw driver or nail file, then pry up the other end of the chip. Repeat at both ends as necessary and then lift off the chip. Do not pry the black plastic socket from the circuit board. Put the Controller Integrated Circuit (labeled 1771) aside.

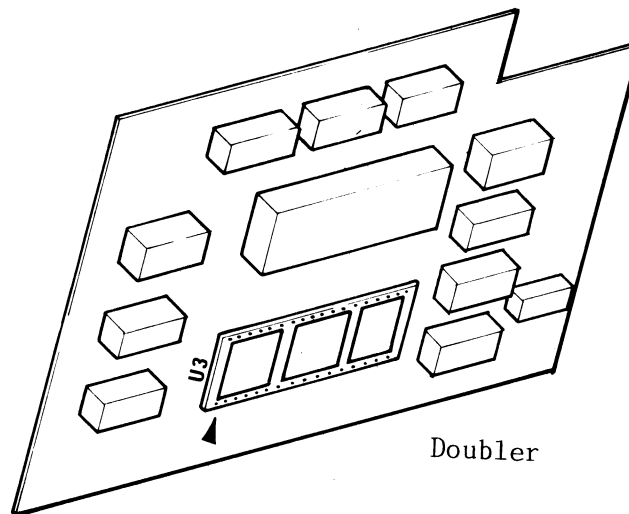
If you have Configuration A, throw the single-density data separator (small square circuit board about 2 inches by 2 inches) away. The Doubler that you purchased contains a single-density and double density data separator; therefore, no options are lost by throwing away the single-density separator. Continue with the next section, Insert the Integrated circuit on the Doubler.

If you have Configuration B, continue with the next section, Insert the Controller Integrated Circuit on the Doubler.



## Look at the Doubler

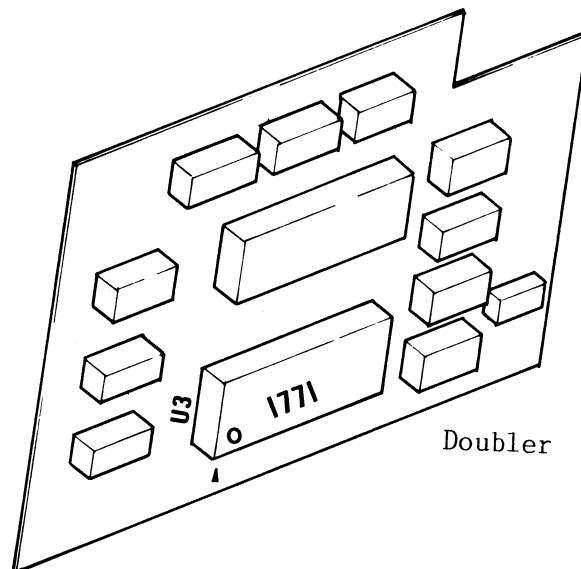
The Doubler is a printed circuit board that measures about 5 inches by 3 inches.



## Insert the Controller Integrated Circuit on the Doubler

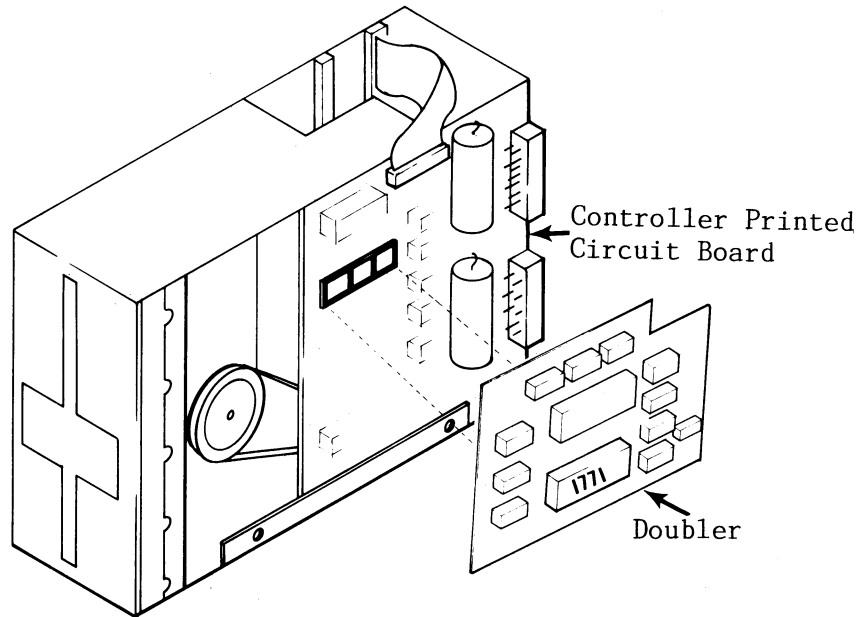
Find the black plastic socket labeled U3 on the Doubler. Insert the Controller Integrated Circuit (labeled 1771) into this socket. The circular cutout on the integrated circuit is to be lined up with the white arrow on the Doubler.

**Caution** - Do not bend the legs of the integrated circuit while installing it on the Doubler and be sure each leg is inserted in a hole of the black socket.



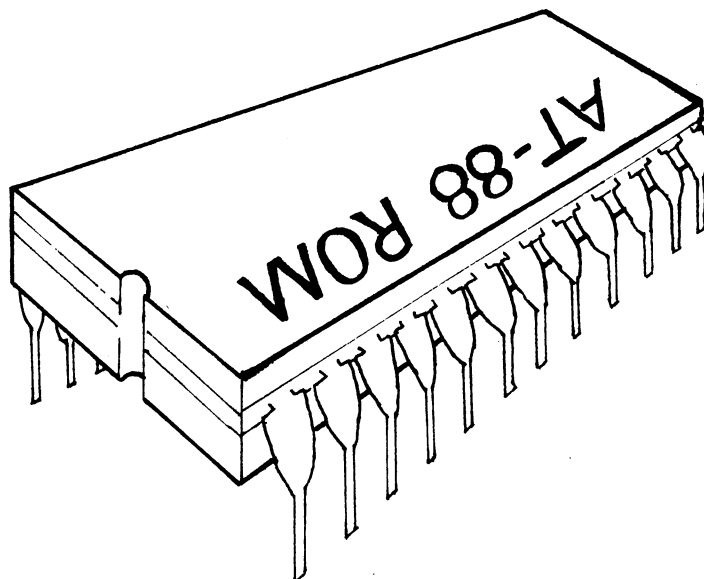
## Put the Doubler on the Controller Printed Circuit Board

Look on the back of the Doubler. Find the two rows of 20-pins; these pins must be plugged into the black socket that originally held the Controller Integrated Circuit. This black socket is found on the Controller Printed Circuit Board.



## Look at the AT-88 ROM

A new AT-88 ROM is included with the Doubler. The AT-88 ROM is an integrated circuit. Note the notch on the AT-88 ROM.

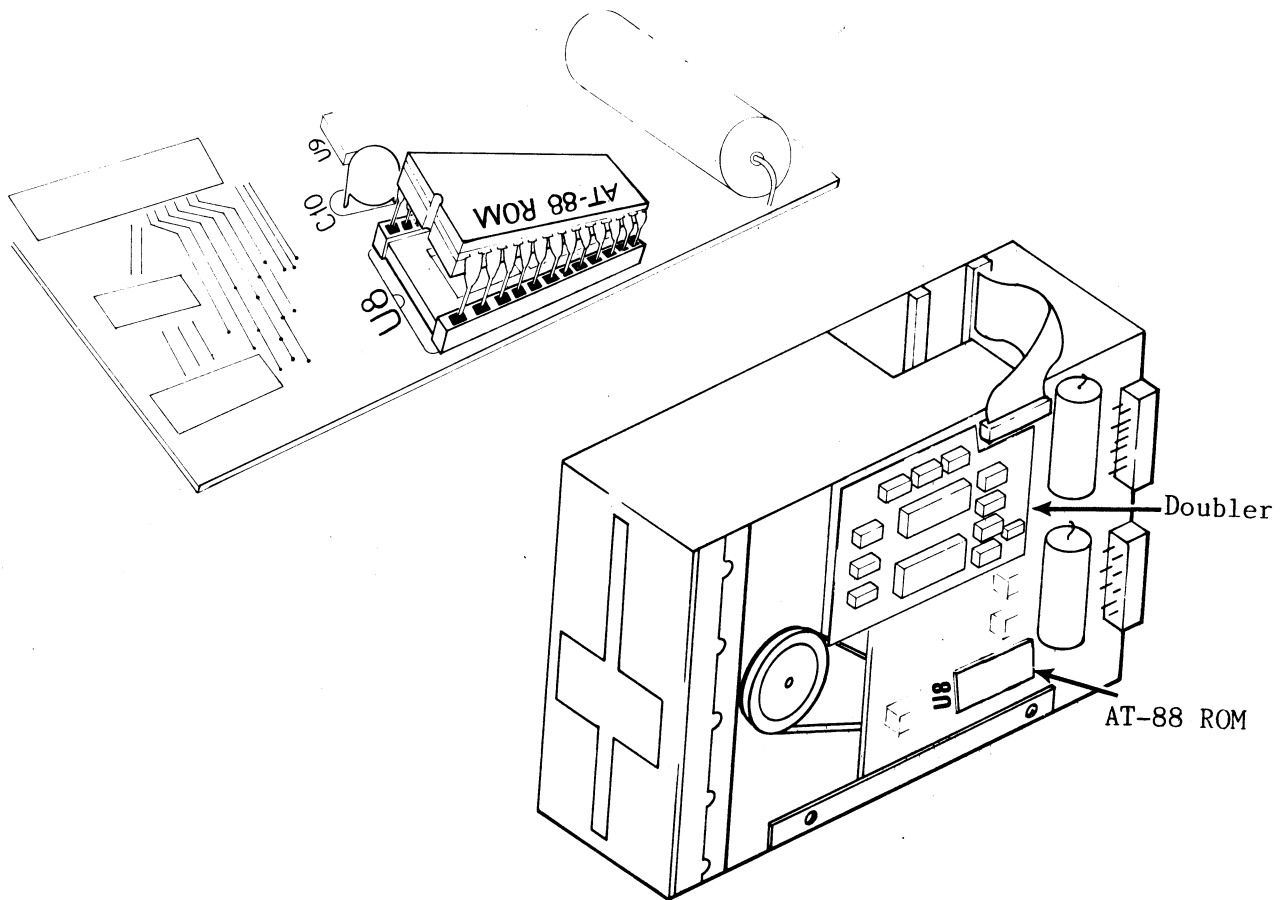


# Replace the AT-88 ROM on the Controller Printed Circuit Board

In order for the Doubler to work, you must replace the old AT-88 ROM with the new AT-88 ROM. (The new AT-88 ROM supports double density.)

Find the old AT-88 ROM on the Controller Printed Circuit Board; it is inserted into the black plastic socket labeled U8. Gently remove the old AT-88 ROM and throw it away. Insert the new AT-88 ROM into the black plastic socket labeled U8.

Note - The notch on the new AT-88 ROM must line up with the notch drawn on the Controller Printed Circuit Board.



Reinstall the cover of the floppy disk drive when you are finished.

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## CHAPTER THREE

3-1 What Happens in this Chapter?

3-1 Check the Controller Drive



**Chapter Three describes a system with  
only one floppy disk drive.**

1. The first part of the document is a list of names and addresses of the members of the committee. The names are listed in alphabetical order, and the addresses are listed below each name. The list includes names such as Mr. J. H. Smith, Mr. J. B. Jones, and Mr. W. C. Brown.

## What Happens in this Chapter?

Perform this Chapter if you have one floppy disk drive. If you have two or more floppy disk drives, perform Chapter 4 instead.

This chapter is to be performed in one session. The Controller Drive (Drive 1) is checked.

If you have any problems, read Chapter 2 again and be sure to install the Doubler correctly. Each leg of the integrated circuit must be inserted into a hole in the black socket (refer to page 2-3).

## Check the Controller Drive

The following section checks if your Controller Drive (Drive 1) is working by duplicating the OS/A+ Diskette.

1. Insert a write-protected Double-Density OS/A+ 4.1 Diskette into Drive 1 and close the door.
2. Turn on the following in this order: Percom Data Floppy Disk Drive, Atari 810 Drive (if you have one), and the computer.
3. A long introduction, a menu, and YOUR SELECTION are displayed. To access OS/A+ 4.1, enter:  
9 (RETURN)
4. D1: is displayed. To duplicate the OS/A+ 4.1 Diskette, enter:  
DUPDSK (RETURN)
5. The prompt SOURCE DISK DRIVE (1, 2, 3, 4) is displayed. (Source disk refers to the OS/A+ 4.1 Diskette.) Enter:  
1 (RETURN)
6. The prompt DESTINATION DISK DRIVE (1, 2, 3, 4) is displayed. (Destination disk refers to a blank diskette.) Enter:  
1 (RETURN)
7. The prompt FORMAT DESTINATION DRIVE (Y OR N) is displayed. Enter:  
Y (RETURN)
8. The prompts PUT SOURCE DISK IN DRIVE 1 and WHEN READY HIT RETURN are displayed. The OS/A+ 4.1 diskette is already in Drive 1. Enter:  
(RETURN)

9. The prompts READING SOURCE DISK, PUT DESTINATION DISK IN DRIVE 1, and WHEN READY HIT RETURN are displayed. Remove the OS/A+ 4.1 Diskette from Drive 1, and insert a blank diskette into Drive 1 and close the door. Enter:

(RETURN)

10. The prompts FORMATTING DESTINATION DISK, WRITING DESTINATION DISK, PUT SOURCE DISK IN DRIVE 1, and WHEN READY HIT RETURN are displayed. Remove the blank diskette from Drive 1, and insert the OS/A+ Diskette and close the door. Enter:

(RETURN)

11. The prompts READING SOURCE DISK, PUT DESTINATION DISK IN DRIVE 1, and WHEN READY HIT RETURN are displayed. Remove the OS/A+ disk from Drive 1, and insert the blank diskette in Drive 1 and close the door. Enter:

(RETURN)

12. You may have to repeat steps 10 and 11. Proceed according to the prompts and then do step 13.

13. The prompts WRITING DESTINATION DISK, \*\*\*DUPLICATE DONE\*\*\*, and COPY SAME DISK AGAIN (Y OR N) are displayed. Enter:

N (RETURN)

14. Remove what was a blank diskette from Drive 1 and label it Backup Double-Density OS/A+ 4.1, and put a write-protect tab on it.
15. Turn the computer off, insert the Backup Double-Density OS/A+ 4.1 into Drive 1, and turn the computer on. You should get a long introduction and the prompt YOUR SELECTION on the screen.

If there is a problem, start again with step 1.

## CHAPTER FOUR

- 4-1 What Happens in this Chapter?
- 4-1 Check the Controller Drive
- 4-3 Change the STARTUP.EXC File





**Chapter Four describes a system with two, three or four floppy disk drives.**

Faint, illegible text, possibly bleed-through from the reverse side of the page.

## What Happens in this Chapter?

Perform this Chapter if you have two or more floppy disk drives. If you have one floppy disk drive, perform Chapter 3 instead.

This chapter is to be performed in one session. The following occur:

- The Controller Drive (Drive 1) and Drive 2 are checked. Drives 3 and 4 can also be checked.
- The STARTUP.EXC file is changed in order for Drive 2 (and Drive 3 and 4 if you have them) to be assigned Double Density.

If you have any problems, read Chapter 2 again and be sure to install the Doubler correctly. each leg of the integrated circuit must be inserted into a hole in the black socket (refer to page 2-3).

## Check the Controller Drive

The following section checks if the Controller Drive (Drive 1) and Drive 2 are working by duplicating the OS/A+ Diskette.

1. Turn on the following in this order: Percom Data Floppy Disk Drive, Atari 810 Drive (if you have one), and the computer.
2. Insert a write-protected Double Density OS/A+ 4.1 Diskette into Drive 1 and a blank diskette into Drive 2. Be sure to close both doors.
3. A long introduction, a menu, and YOUR SELECTION are displayed. To access OS/A+ 4.1, enter:

9 (RETURN)

4. The prompt D1: is displayed. You need to temporarily configure Drive 2 to double density. Enter:

CONFIG 2D (RETURN)

A long list of drives and their densities, and D1: are displayed.

5. To duplicate the OS/A+ 4.1 Diskette, enter:

DUPDSK (RETURN)

6. The prompt SOURCE DISK DRIVE (1, 2, 3, 4) is displayed. (Source disk refers to the OS/A+ 4.1 Diskette.) Enter:

1 (RETURN)

7. The prompt DESTINATION DISK DRIVE (1, 2, 3, 4) is displayed. (Destination disk refers to a blank diskette.) Enter:

2 (RETURN)

8. The prompt FORMAT DESTINATION DISK (Y/N) is displayed. Enter:

Y (RETURN)

9. The following prompts are displayed:

PUT SOURCE DISK IN DRIVE 1  
PUT DESTINATION DISK IN DRIVE 2  
WHEN READY HIT RETURN

The OS/A+ 4.1 Diskette is already in Drive 1 and the blank diskette is already in Drive 2. Enter:

(RETURN)

10. The following prompts are displayed:

READING SOURCE DISK  
FORMATTING DESTINATION DISK  
WRITING DESTINATION DISK  
READING SOURCE DISK  
WRITING DESTINATION DISK  
READING SOURCE DISK  
WRITING DESTINATION DISK  
\*\*\*DUPLICATE DONE\*\*\*  
COPY SAME DISK AGAIN (Y OR N)

Enter:

N (RETURN)

11. Remove the OS/A+ 4.1 Diskette from Drive 1 and remove what was a blank diskette from Drive 2. Label the former blank diskette Backup Double-Density OS/A+ 4.1.

12. Turn the computer off, insert the Backup Double-Density OS/A+ 4.1 into Drive 1, and turn the computer on. You should get a long introduction and the prompt YOUR SELECTION on the screen. To access OS/A+, enter:

9 (RETURN)

13. If you only have Drive 2, continue with the section CHANGE THE STARTUP.EXC FILE.

If you have Drive 3 or Drive 4, repeat this section. All prompts are identical except for step 4. Instead of entering CONFIG 2D for Drive 2, enter CONFIG 3D for Drive 3 or CONFIG 4D for Drive 4. Continue with the section CHANGE THE STARTUP.EXC FILE.

## Change the STARTUP.EXC FILE

By changing the STARTUP.EXC file, floppy disk drives 2, 3, and 4 are automatically assigned to be Double-Density.

1. With your Backup Double-Density OS/A+ Diskette in Drive 1, delete the current STARTUP.EXC file by entering:

```
ERASE STARTUP.EXC (RETURN)
```

2. By using the COPY command and the screen editor (E:), you can create a new STARTUP.EXC file. Enter:

```
COPY E: STARTUP.EXC (RETURN)
```

3. The screen clears. Enter the following. (If you do not have Drive 3 or Drive 4, omit the lines CONFIG 3D and CONFIG 4D):

```
CONFIG 2D (RETURN)
CONFIG 3D (RETURN) (optional line)
CONFIG 4D (RETURN) (optional line)
DIR (RETURN)
```

Hold down the CTRL button and press the 3 button at the same time

4. The prompt D1: is displayed.
5. Turn your computer off and then on. Watch the display screen as STARTUP.EXC assigns Drives 2, 3, and 4 to Double Density.

THE HISTORY OF THE UNITED STATES

The history of the United States is a story of growth and change. From the first settlers to the present day, the nation has evolved through various stages of development. The early years were marked by exploration and the establishment of colonies. The American Revolution led to the birth of a new nation, and the subsequent years saw the expansion of territory and the growth of industry. The Civil War was a pivotal moment in the nation's history, leading to the abolition of slavery and the strengthening of the federal government. The 20th century brought significant social and economic changes, including the rise of the industrial revolution and the emergence of the United States as a global superpower. Today, the United States continues to face new challenges and opportunities, and its history remains a source of inspiration and guidance for the future.

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PROBLEM REPORT FORM

In case of a problem, please read the instructions on the last page of this manual. If you need to report a problem, please fill out this form completely and send it to Percom Data. If it is necessary to return equipment to solve the problem, include a copy of the problem report with the returned equipment. If you do not need to return equipment, mail this report to the Service Department at Percom Data Corp.

We suggest you retain a copy for reference.

a. Your Name \_\_\_\_\_ Date \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone Number \_\_\_\_\_

b. Percom Data Product \_\_\_\_\_ Version \_\_\_\_\_

Date of Purchase \_\_\_\_\_ Dealer's Name \_\_\_\_\_

c. Description of Your Equipment

Computer \_\_\_\_\_ Version \_\_\_\_\_ Memory \_\_\_\_\_

Disk System \_\_\_\_\_ Make of Drives \_\_\_\_\_

Number of Drives \_\_\_\_\_ Number of Tracks Each Drive \_\_\_\_\_

Make and Model of Printer \_\_\_\_\_

Other Peripherals \_\_\_\_\_

Disk Operating System \_\_\_\_\_ Version \_\_\_\_\_

Other Software \_\_\_\_\_

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## IMPORTANT NOTICES

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### IN CASE OF DIFFICULTY PLEASE, REREAD THE INSTRUCTION MANUAL

If you are unable to resolve your problem, either contact your Percom Data Retailer for assistance or mail us a letter with a completed Problem Report Form enclosed. A Problem Report Form is included at the end of this manual.

When your letter is received, your problem will be given to customer service. Every effort will be made to respond to your letter promptly. If necessary, customer service will attempt to duplicate your problem, and will confer with engineers and other technicians as required. Customer service may write or call you for more operation.

If you return equipment for repair, please be sure to follow the procedures given below. Be sure to enclose a completed Problem Report with the returned equipment.

### HOW TO RETURN EQUIPMENT FOR REPAIR

Please read the above information under IN CASE OF DIFFICULTY before proceeding to return equipment for repair.

You have done everything you know how to do. You have read and reread the instruction manual and technical memos but you still cannot get your system to work!

It is time to let us help. We have yet to find a sick unit that cannot be restored to full health and vigor.

There are a few things you can do that will help us expedite your repair:

1. Write or call for return authorization before returning any merchandise. RETURNS WITHOUT AUTHORIZATION WILL BE REFUSED.
2. Copy the blank Problem Report, fill in the copy, and return the unit for repair. Questions that do not relate to the reason the unit is being returned for repair must be sent in under separate cover.
3. OUT-OF-WARRANTY repairs are performed for a labor charge, parts, and shipping. If we find that a unit is functioning properly as received and does not require any service, there will be a CHECKOUT CHARGE plus return shipping and insurance. Do not enclose any payment. The unit will be returned C.O.D. for authorized repairs and shipping.
4. When returning a unit for repair, pack it in a large carton with at least 3 inches of padding on all sides. We will not attempt to service any unit if there is shipping damage until the claim is settled. Ship prepaid by UPS or INSURED PARCEL POST to: Service Department, Percom Data Corporation, 11220 Pagemill Road, Dallas, Texas, 75243.

#### HOW TO ORDER MERCHANDISE BY MAIL

The following procedures will help us expedite your mail orders. We suggest, however, that you make your purchase from an authorized Percom Data Retailer whenever possible. If you do not know the name of a nearby Percom Retailer, call our toll-free order number and ask for Sales.

**TOLL-FREE PHONE ORDERS:** To save you toll money and insure prompt service, we have installed a toll-free number (1-800-527-1222) FOR PLACING ORDERS ONLY. We cannot transfer calls received on our toll-free number to other departments - please help us serve you better by dialing the correct number.

**PROMPT SERVICE:** We ship the cheapest, fastest way. We use UPS up to 50 pounds per item, 100 pounds per shipment. We use truck freight for large or heavy shipments. Transportation charges are collected on delivery.

**C.O.D. ORDERS:** C.O.D. orders are accepted where possible.

**TEXAS SALES TAX:** Texas law requires that we collect a 5% sales tax on all shipments within Texas.

**MINIMUM ORDERS:** We will add a handling charge of \$2.00 to all orders totaling less than \$15.00.

**DAMAGED SHIPMENTS:** Have the carrier note if the shipment is in damaged condition, then file a claim. If there is concealed damage, contact the carrier for an inspection and then file a claim. Save your shipping carton.



